

ADDITIONAL NOTES ON THE DRAGONFLIES OF NORTHWESTERN OHIO

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INTRODUCTION

These notes are based on 2400 specimens of Odonata collected by the writer and others during the eight years 1949 to 1956, inclusive. Most of the specimens were collected by the writer and are in the writer's collection, but some rarities have been donated to The Ohio State Museum and to the private collections of Dr. D. J. Borror, Dr. Philip P. Calvert and Dr. E. M. Walker. Dr. Borror has kindly checked or determined nearly all of the less common species, such as *Aeshna canadensis*, *A. interrupta*, *A. verticalis*, *Sympetrum costiferum*, and *S. internum*. The writer is further indebted to Dr. Borror for suggestions in the preparation of this paper. The records cover Auglaize, Defiance, Fulton, Henry, Lucas, Mercer, Paulding, Putnam, Van Wert, Williams, and Wood counties.

A previous paper (Price, 1950) brought the list of Odonata recorded from Ohio to 138 species; Kormondy's paper (1956) increased the number to 139 species. Five additional species are recorded in this paper, *Enallagma cyathigerum*, *Aeshna canadensis*, *A. interrupta*, *Sympetrum costiferum*, and *S. internum*, bringing the list to 144. Dr. Montgomery's paper (1943) and mine (1950) recorded 74 species for Williams County; sight records for five additional species were mentioned but not counted. These species have been secured since then, plus 21 other species, bringing the total for the county up to 100. All but two of the 100 species have been taken in two townships, Northwest and St. Joseph. Since Kellicott (1899) recorded fewer species for the entire state, it can be surmised that Williams County is a fine place for Odonata. Special attention was given to collecting in the county, as the statement was made in my previous paper: "It seems very likely that with additional collecting, Williams County, the extreme northwestern county in Ohio, will equal or exceed every other county in the state in the number of species of Odonata; it is conceivable that as many as 100 species may eventually be taken there." The Williams County list now ranks first in the state but is still far from complete; no specimens have been taken in several townships. *Anax longipes* has been seen at Mud Lake, but it is too rare and wary to consider its capture certain. The following species are certain to be added to the county list in a matter of time: *Gomphus vastus*, *Dromogomphus spinosus*, *Sympetrum ambiguum*, and *Neotetrum corruptum*.

A total of 81 species have been recorded for Paulding County; many counties will exceed it in number of species as it lacks bogs and lakes.

The localities at which the collections recorded in this paper were made are as follows:

Auglaize Co.—The State Fish Hatchery near St. Mary's.

Defiance Co.—Little (Krill's) Lake, Lehman's (Big) Lake, Ladd's Lake, a buttonbush swamp southwest of Ladd's Lake, the Auglaize River and its lagoons south of Defiance, the Miami Extension Canal, and temporary ponds in fields near Ladd's Lake.

Fulton Co.—Harrison Lake and Mill Creek.

Henry Co.—Maumee River, Miami and Erie Canal, and a large pond near the Clevite Corporation.

Lucas Co.—Ponds and streams in the Oak Openings State Park, and the Maumee River near the Providence Dam.

Mercer Co.—Achbach's Landing and the Grand Reservoir (St. Mary's Lake), fish ponds just west of the Lake, and the Wabash River in Recovery Township.

Paulding Co.—Maumee, Auglaize, and Little Auglaize Rivers, Flatrock, Blue and Marie DeLarme Creeks, four artificial ponds at the Great Lakes Sugar Company at Paulding, a pond

beside the Auglaize Quarries in Auglaize Township, a small pond in the woods along the Miami Canal about one half mile southwest of Charloe, an artificial pond two miles north of Melrose, the large tile pond at Haviland, various ditches along roads and between fields, various gravel pits, two abandoned quarries east of Grover Hill, and the Miami and Wabash Canals.

Putnam Co.—An old tile pond at Miller City.

Van Wert Co.—An abandoned stone quarry at Willshire, a small deep pond at the Schumm sawmill, and a tile pond northwest of Convoy.

Williams Co.—St. Joseph's River, Fish and Nettle Creeks, Mud, Nettle and Hayes Lakes, various ponds, marshes, gravel and marl pits, Dehn's Swamp in Florence Township, and several streamlets.

Hayes Lake is about one mile east of Nettle Lake; it is rectangular and has an area of about five acres. Several years ago there was a landslide on the south shore, and approximately half an acre of shore slipped into the lake; the tops of trees can still be seen under the surface. It appears to be a deep lake; the owner informs me it is 30 feet deep near the south shore. The collecting has been disappointing thus far at Hayes but has been good at a permanent pond west of the lake as well as at a permanent pond about $2\frac{1}{2}$ miles east of the lake.

Wood Co.—Beaver Creek and the Portage River.

The records are given by counties; an asterisk preceding a county name indicates a new county record. The numbers are those of Borror's (1937) list.

LIST OF SPECIES

2. *Progomphus obscurus* (Rambur). **Williams.** This species occurs regularly at Fish Creek, about one mile north of Edgerton. One male was taken June 16, 1951, and 4 males June 18, 1952.

3. *Hagenius brevistylus* Selys. **Williams.** A single specimen of this large species was seen along the St. Joseph's River in August, 1952, but it was not secured. One male was taken in the woods near Hayes Lake, June 11, 1953. It seems to be rare here.

5. *Erpetogomphus designatus* Hagen. ***Paulding.** A male was captured July 29, 1954, on a boulder in the Maumee River about $\frac{1}{2}$ mile upstream from the Forder bridge; another was seen; both were very wary.

7. *Gomphus (Stylurus) amnicola* Walsh. **Williams.** This rare species has been taken sparingly. One male was captured August 25, 1949, along the St. Joseph's River north of Edgerton; another male was taken on a cool rainy day, June 20, 1951, near Fish Creek north of Edgerton. A female was secured June 18, 1952, along the St. Joseph's River southeast of Blakeslee. A male was taken August 27, 1956, at the St. Joseph's River north of Edgerton.

9. *Gomphus exilis* Selys. **Williams.** This species has a rather short season in June. It is common in the vicinity of Nettle Lake, as well as at some spots along Nettle Creek.

138. *Gomphus externus* Hagen. **Paulding.** This very wary insect occurs regularly at the ripples of the Maumee River above the Forder bridge. It seems to prefer boulders in the middle of the river and is seldom seen along the shore; when fresh it appears lighter in color than *G. fraternus* and is considerably larger. Captures were made as follows: 1 female August 13, 1949, 1 male July 16, 1952, 6 males July 19, 1953, one female August 1, 1953, and 3 males July 29, 1954.

10. *Gomphus fraternus* (Say). **Paulding, Williams.** *G. fraternus* seems to prefer creeks and rivers; I have never taken it at a gravel pit. It is the most common of the Gomphines in this area.

11. *Gomphus furcifer* Hagen. ***Williams.** One male was collected on a water lily pad at Mud Lake June 19, 1949.

12. *Gomphus graslinellus* Walsh. ***Lucas, Paulding, Williams.** This *Gomphus* is exceeded in numbers here only by *G. fraternus*. It occurs at creeks, rivers, ponds, lakes, and gravel and marl pits. Two males and 2 females were taken at the Oak Openings in Swanton Township, Lucas County, June 8, 1950.

14. *Gomphus lividus* Selys. ***Lucas, Williams.** On June 23, 1952, 2 males and 4 females were secured near Gale Run at the Oak Openings in Lucas County. This species is partial to spring-fed streams.

16. *Gomphus (Stylurus) plagiatus* Selys. **Paulding.** This species is fairly common at the ripples of the Maumee River above the Forder bridge, but its flight is so erratic that it is difficult to take. It spends much of its time well up in the foliage of trees and must be captured in flight; it is unusual for this species to alight on the ground or on boulders in streams. One male was taken at the above mentioned ripples August 13, 1949; several were seen on the following day but only one male was secured during three hours of collecting. Four males were taken September 2, 1955.

17. *Gomphus quadricolor* Walsh. **Williams.** This species is rare and local, and has a very short flight season. It occurs some years at Fish Creek, about one mile north of Edgerton. In 1949, 1 male and one female were taken May 23, and one female May 28.

18. *Gomphus spicatus* Hagen. **Williams.** This is an abundant species at Mud Lake, where it occurs every year. I take it sparingly nearly everywhere else. Specimens taken in late May are generally teneral; by July 4, the species has practically disappeared.

19. *Gomphus (Stylurus) spiniceps* (Walsh). **Williams.** I enjoy collecting this species more than any other. Nearly all of my specimens have been taken at the junction of Fish Creek and the St. Joseph's River northeast of Edgerton. A few have been swept from the foliage of trees overhanging the river but most of them have been taken with a quick down-stroke, using a large net with a four foot handle as they flew past me. On a large river such as the Maumee this is an exceedingly difficult dragonfly to catch. I have taken a single specimen there. In 1949, 35 males were taken August 21, from noon to 5.00 P.M., 14 males August 25, 1 male September 2, 8 males September 26, and 3 females were seen but not collected October 1. In 1951 the species was scarce; 2 males were taken September 3 and 1 male Sept. 24. It was fairly common August 22, 1952, when 5 males were secured, and again on Sept. 9, when 6 males were captured.

21. *Gomphus ventricosus* Walsh. **Williams.** This species is rather common some seasons along Fish Creek and the St. Joseph's River north of Edgerton. The flight season is rather brief; most of my specimens have been taken in June. Three males and 3 females were taken June 14, 1950, at Fish Creek and the St. Joseph's River; a female was taken at the same location June 18, 1952.

22. *Gomphus villosipes* Selys. ***Lucas, *Paulding, *Williams.** A female was taken while ovipositing in a pond in Gale Run, Lucas County, June 23, 1952. Three males were taken June 22 and July 1, 1951, at a muddy pond at the Auglaize Quarries southeast of Junction, Paulding County. One female was secured while ovipositing in algae in a pond in Florence Township, Williams County, June 16, 1950. Six males were secured at a small pond in Northwest Township, Williams County, June 18, 1954. The Paulding County record seems surprising; I had always supposed the species occurred at clear-water ponds.

24. *Dromogomphus spinosus* Selys. ***Paulding.** One male was taken August 7, 1950, on a boulder in the Maumee River one half mile above the Forder Bridge.

25. *Dromogomphus spoliatus* (Hagen). ***Fulton, Paulding, *Williams.** This species is often so wary that it is an exciting insect to capture. Sometimes it will alight on a stone or log lying in the water and slowly turn round and round as if very alert for danger; at other times it may be easily taken. One female and 3 males were captured August 19, 1953, on Flatrock Creek, above the dam at Paulding. The female was taken while she was ovipositing in the water while flying slowly and tapping the tip of the abdomen in the water. The species was very common August 15, 1956 along the Little Auglaize River west of Oakwood, Paulding County. Six males and 1 female were taken July 17, 1956, at Harrison Lake, Fulton County; another male was taken at the lake on August 11. A male was secured August 8, 1956 at a large gravel pit in Madison Township, Williams County.

28. *Basiaeschna janata* (Say). **Williams.** This is a common species at Nettle Lake. Sixteen specimens taken during the eight year period have been males and were taken from May 15 to June 14 (average date, June 5). The species prefers sunny lanes in woods.

30. *Boyeria vinosa* (Say). **Williams.** The nervous flight of this species together with its brown wings and body, make it a difficult insect to take. It is generally common along Fish Creek and its confluence with the St. Joseph's River, but was scarce in 1952 and 1953.

31. *Anax junius* (Drury). **Defiance, Paulding, *Van Wert, Williams.** My collecting in 1951 and 1952, began with specimens of this hardy species. One male was taken at a small pond near Nettle Lake, April 27, 1949; the weather was warm and fine and several were seen, and some were in copula. A small male was taken April 16, 1952, and several were seen. Two males were taken August 3, 1949, at the tiny deep pond at the sawmill at Schumm in Van Wert County. On September 6, 1952, I watched a large number (probably several thousand) flying southward and southeastward; they were watched for several minutes; finally only a few were seen. It is unusual to take males with bluish abdomens during the fall; at that time nearly all have pinkish abdomens. They are very wary then and do not have the appearance of teneral.

32. *Anax longipes* Hagen. ***Paulding.** Two males of this large and handsome species (of five seen) were taken at a pond of the Paulding Sugar Company July 21, 1949; they were taken at intervals in the afternoon between light showers. They were very wary and were secured with difficulty by means of a special large net with a five-foot handle. They patrolled a beat near several trees where I suspected a female was hidden in the foliage. They sometimes grasped each others abdomens. Two males were seen the following afternoon and one was secured and donated to The Ohio State Museum. Two small boys told me about seeing large red dragonflies at a pond near Charloe, and a farmer remarked about the large red dragonflies that he saw flying over the Maumee River upstream from the Forder bridge, in July, 1949. I saw two of them flying at Mud Lake June 22, 1949; one had a brilliant red abdomen; they flew 10 or 15 feet above the water.

33. *Nasiaeschna pentacantha* (Rambur). ***Paulding, *Williams.** A male was taken June 12, 1950, at an artificial pond along the Miami Canal southwest of Charloe in Paulding County; several were seen but they were too wary for me. On June 3, 1951, two males were taken at a pond near Nettle Lake; several were observed. This species is fairly common at Nettle Lake and ponds nearby. I find them difficult to collect.

34. *Epiaschna heros* (Fabricius). **Paulding, Williams.** This is the largest of our local dragonflies. On June 6, 1950, 11 females were secured in the Miami Canal southwest of Charloe in Paulding County. Some were ovipositing on trunks of small trees growing in the canal, both below the water line as well as some inches above it. One oviposited six feet above the water in the stem of a wild rose bush. Two tried to oviposit on rusty tin cans. Wet pieces of wood were favorite places. One female was taken at the same locality by hand June 12, 1950; about 25 were seen; they would have been very easy to collect. On June 10, 1950, three females were taken at Dehn's Swamp in Williams County, and two females were taken at a pond beside Nettle Lake. I do not recall ever seeing this species as late as July 1.

141. *Aeshna canadensis* Walker. ***Defiance, Williams.** A new State record. The Defiance County specimens were taken at Lehman's (Big) Lake in 1951; one male was taken Oct. 1, 2 males and 1 female Oct. 2, and 1 female Oct. 5. Lehman's Lake is very shallow and much of it is covered with pickerel weed. The Williams County specimens were secured at a shallow marshy pond on the Ohio-Indiana state line. The pond contains about 8 acres; only about 1 acre lies on the Ohio side, which is the best place to collect. One male was taken September 29 and 1 female Oct. 5, 1951, on the Ohio side. A male was taken at Mud Lake September 14, 1951. This was the only species of *Aeshna* observed at Mud Lake on September 26, 1956, when 4 males and 1 female were secured from 10 A.M. to 1 P.M. In life this species closely resembles *A. verticalis*. Apparently it is a late-season species.

35. *Aeshna clepsydra* Say. **Williams.** I have taken the species only at Mud Lake, where it is irregular in occurrence. Two males were secured August 28, 1950, and 3 or 4 more were seen. Four males were taken September 14, 1951, and 2 males September 21. A male taken September 9, 1955, was the only *Aeshna* seen. In flight this species appears paler than the other species of *Aeshna*. Kellicott recorded this species for Ohio but his description of the marks on the side of the thorax definitely does not fit this species.

36. *Aeshna constricta* Say. **Defiance, Paulding, *Putnam, Williams.** This is our commonest *Aeshna*. It was very plentiful at a pond in Florence Township, Williams County, in the fall of 1950; 10 males were taken Sept. 10, 46 males and 4 females Sept. 15, 26 males and 8 females Sept. 18, 43 males and 2 females Sept. 20. At Lehman's Lake in Defiance County, 13 males and 1 female were taken Oct. 1, 1950; a total of 225 males and 23 females were taken in 1950; they became common on Sept. 15 and were still fairly common on Oct. 5. Several males have small extra cells in the anal triangles of the hind wings, so that they actually have four cells instead of three; this occurs seven times on right wings and three times on left wings; there are also incomplete veins in the anal triangles of three specimens. The species was common in 1951, but in 1952 was found sparingly everywhere. A single male was taken in Paulding County October 4, 1952. In 1956 the species was the most plentiful that I have ever observed at the Miller City tile pond in Putnam County. None were seen on August 17, but they were abundant Sept. 24; they were still common Oct. 4; On Oct. 28, a single male was seen and captured.

142. *Aeshna interrupta* Walker. ***Williams.** A new state record. A single male was

captured Sept. 21, 1951, at Mud Lake. The two lines on the side of the thorax are very slender, straight and parallel. I immediately recognized it as a species new to my collection. It appears to be race *lineata*. Walker records it for northern Michigan; this record is far south of the usual range. The wings were undamaged and gave it the appearance of a specimen that might have emerged at Mud Lake.

37. *Aeshna mutata* Hagen. **Williams.** This early-season *Aeshna* occurs regularly at Mud Lake. One learns to identify it at a distance by the handsome blue face and compound eyes. It has a short flight season, and by the last of June is uncommon. At Mud Lake one needs a boat and a large net to get this species. When still somewhat teneral it flies over the fields near the lake, but when fully mature seems to be flying most of the time over the water well out from the shore. Five rather teneral specimens were taken at Dehn's Swamp June 4 and 10, 1950; none were highly colored but all had the appendages peculiar to this species. *A. mutata* seems to fly very little in the afternoons.

38. *Aeshna umbrosa* Walker. **Defiance, *Lucas, Paulding, Williams.** This species was found in Paulding County around ditches through fields where there was no shade; two males and 3 females were taken in such a location August 27 and 28, 1951. It was common at a button-bush swamp near Ladd's Lake in Defiance County in 1951; only one was captured on Sept. 17 but several were seen flying low under the buttonbushes (*Cephalanthus*), where it was almost impossible to capture them. I find this insect hard to see when it is flying in the shade, the usual habitat.

39. *Aeshna verticalis* Hagen. **Paulding, Williams.** I have taken this species in very limited numbers. I secured a nice male along a ditch in Paulding County Sept. 4, 1951, by dropping my straw hat over it. Eight males were taken in Williams County from August 9 to September 22, 1950.

43. *Cordulegaster obliquus* Say. ***Williams.** A fine female, flying near some tamarack trees, was taken at Mud Lake May 28, 1952. Two more females were secured June 11, 1953, on a bushy hill near Hayes Lake. A male was taken at the same locality June 19, 1956, and another small male 3 days later along a streamlet through brushy woods in Bridgewater Township. The yellow spear-shaped spots on the dorsum of the abdomen readily distinguishes this large species.

44. *Macromia illinoensis* Walsh. **Paulding, Williams,** These dark *Macromias* are often common in August at ripples in the Maumee River, about a half mile above the Forder bridge. They are difficult to see, as their dark bodies blend with the dark water when they fly low just above the surface. The Williams County specimens have been taken from June to September, flying over Fish Creek and the St. Joseph's River. Even when ovipositing the flight of the females is fast and erratic.

45. *Macromia taeniolata* Rambur. ***Fulton, Paulding, *Williams.** This species appears somewhat later in the season than *M. illinoensis*. It is easier to see, as it is larger and lighter in color. I find a large net with a long handle almost a necessity to take it. Nearly all of my specimens have been taken in August. It is common on the Auglaize and Little Auglaize Rivers but is rather scarce on the Maumee. Two males were taken at Nettle Lake, August 25, 1949, and another male was taken there August 13, 1953. Four males were secured August 11, 1956, at Harrison Lake in Fulton County.

135. *Macromia wabashensis* Williamson. ***Paulding.** A female with beautiful flavescent wings was taken June 22, 1951, along the Miami Canal near Charloe. Though somewhat teneral she flew well and proved very hard to capture. My only other specimen of this species was taken several years previously along the same canal. Both specimens were taken in June, while my earliest record for *M. taeniolata* is July 16. It is possible that these may merely be rather immature specimens of *M. taeniolata*.

49. *Epicordulia princeps* Hagen. ***Paulding, *Van Wert, *Williams.** This beautiful species is fairly common at Nettle Lake, but I have captured only one specimen there; a male was taken June 18, 1954. A male was taken June 4, 1944, at the abandoned stone quarry at Willshire in Van Wert County. This record was overlooked in my previous paper. A male was taken July 22, 1949, at Klinger's gravel pit in Paulding County. Another male was secured August 15, 1956, at a pond north of Melrose in Paulding County. The species is rare in the latter county.

50. *Tetragoneuria cynosura cynosura* (Say). **Williams.** The species is common in Williams County. I have taken a few specimens in May but many were teneral. They are more in evidence in early June; by the latter part of the month they have nearly disappeared. I have collected them whenever I can in the hope that *T. morio* or *T. spinigera* will turn up.

134. *Somatochlora ensigera* Martin. **Paulding, *Williams.** This species is much less crepuscular than *S. hineana* or *S. linearis*. It seems to prefer ditches, with or without trees along them. The abdomen of the female (with the anterior segments keeled on the dorsum, while the remaining segments are cylindrical), is so different from the females of the other three Ohio species that one wonders if they do not belong in a separate genus. Four males were taken along a ditch near my home in Paulding County on August 2 and 3, 1951. The extensive dredging of ditches in the past five years has probably destroyed a great many of the nymphs. A Williams County specimen was taken at Mud Lake June 29, 1949, after an exhausting search through tall herbage near the lake.

51. *Somatochlora hineana* Williamson. ***Lucas, *Williams.** A male of this rare species was captured June 18, 1949, on the bog meadow of Mud Lake; two more *Somatochlores* observed there were believed to be this species. On June 23, 1952, 15 males and 1 female were collected in the forenoon at the Oak Openings State Park in Lucas County. All specimens were taken along a branch of the Wabash Railway, which passes through a bog there. One female was taken while she tried to get down to the shallow water in which tall grasses and sedges grew. Another female was seen entering a deep narrow trench along the railroad track; the trench had a growth of vegetation above it that practically hid it from view. No doubt she intended to oviposit in the water, which was not more than 2 or 3 inches deep. Nearly all of the males were taken in flight; a few were taken on herbage. They were very easy to capture. Another trip was made to this locality on June 22, 1953, to try for more specimens. One female was taken about one-fourth mile farther west while she was hawking for insects near a narrow trench. Three males were seen but were far too wild to capture. A male and female were taken at the same location July 1, 1956. A female with an egg bundle was secured June 19, 1956, at a shallow pond in Bridgewater Township, Williams County. I presume that the flight season is very short. Two males were donated to Dr. E. M. Walker, the author of the magnificent monograph on the genus. In his letter of appreciation he wrote "I never expected to see this rare species, much less receive specimens for the Museum. It is a most striking insect, on account of its remarkable appendages. I compared it with the only specimen we have of *S. ozarkensis* and found them nearly related but quite distinct."

133. *Somatochlora linearis* (Hagen). **Paulding, *Williams.** This is our most common *Somatochlora* locally, and occurs regularly in Paulding County. I know of two streamlets through woods where one can find some of them every season in August. They are found less regularly around ditches and borders of woods but are fairly common in such locations some years. On August 12, 1955, 5 males and 1 female were taken at a streamlet in the woods near the mouth of Flatrock Creek. The female was ovipositing in mud at the edge of a shallow pool. Three males were swept down from trunks of small trees or the dead branches of trees leaning over the stream, and two males were taken in flight. The stream was dry except for occasional pools. A female was secured near Dehn's Swamp in Williams County June 28, 1950, while she was hawking for insects. Oddly enough I have noticed very few *Somatochlores* in Williams County.

54. *Perithemis tenera* (Say). ***Fulton, *Henry, Paulding, *Van Wert, Williams.** These are common insects at ponds and lakes and even along some streams, especially above dams.

55. *Celithemis elisa* Hagen. ***Auglaize, Lucas, Williams.** A male of this beautiful and common species was taken at the Fish Hatchery near St. Marys, Auglaize County, August 13, 1951. On several occasions I have noticed individuals flying low across fields, two miles or more from a pond or gravel pit.

56. *Celithemis eponina* Drury. ***Auglaize, Lucas, Williams.** Two males were secured at the same station and date as *C. elisa* mentioned above. This is also a common species at ponds and lakes.

57. *Celithemis monomelaena* Williamson. **Williams.** I take the species only at Mud Lake, where it occurs irregularly. One male was taken July 18 and a female August 20, 1950. Five males were secured June 19, and 7 males and 1 female June 25, 1956. The dark markings on the wings make this a conspicuous insect.

60. *Ladona julia* (Uhler). **Williams.** This species occurs regularly and in numbers at Mud Lake from the latter part of May through the month of June; by July the few remaining specimens are usually battered. I find it at no other station.

62. *Libellula cyanea* Fabricius. **Williams.** This species is plentiful at Mud Lake each year; I have never seen it at Hayes or Nettle Lakes. It can be taken throughout the month of July. The two-colored stigma readily separates this species from our other *Libellulas*.

63. *Libellula incesta* Hagen. **Defiance, *Williams.** One male and a pair in copula were collected at Nettle Lake August 18, 1949, where the species is uncommon. I have never seen it at Mud Lake.

64. *Libellula luctuosa* Burmeister. **Defiance, *Fulton, *Henry, *Mercer, Paulding, Williams, *Wood.** The species is common at ponds, lakes, and gravel pits, but may be found sparingly almost anywhere.

65. *Plathemis lydia* Drury. **Defiance, *Fulton, *Henry, Paulding, *Wood.** The species is exceeded in numbers (among the *Libellulas*) only by *L. pulchella*. To me they seem to be the most agile and wary of the *Libellulas*.

66. *Libellula pulchella* Drury. ***Fulton, Lucas, Paulding.** The Ten-spot is our most common *Libellula* and is found everywhere.

67. *Libellula quadrimaculata* Linnaeus. ***Lucas, *Williams.** One female was taken at Hayes Lake June 1, 1953; another female was secured June 11, 1953, at a permanent pond one half mile west of Hayes Lake. Two males were taken June 2, 1955, at the Oak Openings in Lucas County. These are my only captures.

68. *Libellula semifasciata* Burmeister. ***Lucas.** One male was taken June 23, 1952, along the railway at the Oak Openings State Park. This species is very irregular in occurrence; some seasons it is common and other seasons it is rare. It is observed more often in May and early June when it does occur. I have seen none since 1952.

69. *Libellula vibrans* Fabricius. **Paulding.** Three males of this large handsome *Libellula* were taken along the Miami Canal June 25, 1950. They flew in the shade of small trees growing in the canal and were hard to capture. A fine male was taken at the same locality southeast of Charloe June 26, 1951.

70. *Sympetrum ambiguum* Rambur. **Mercer, Paulding.** One male of this green-faced *Sympetrum* was secured August 27, 1952, at the Grand Reservoir. Three males were taken along the Miami Canal near Charloe August 25, 1950. This is a rare species as a rule but I considered it the most plentiful of the *Sympetrum*s in August 1944.

71. *Tanetrum corruptum* (Hagen). **Paulding.** One female was taken while hawking for insects along a ditch and road in Benton Township August 10, 1949; I have seen none since. They were common during two seasons in the past 12 years. Due to their large size it is easy to confuse them in flight with both *Pantala hymenaea* and *P. flavescens*. They are more wary than the *Sympetrum*s.

144. *Sympetrum costiferum* (Hagen). ***Lucas, *Paulding, *Putnam, *Williams.** A new state record. On October 4, 1952, a pair was seen in tandem while the female oviposited by tapping the tip of the abdomen in a shallow pool of Flatrock Creek southwest of Payne. The female had flavescent streaks along the costal margins of the wings and also had the vulvar lamina peculiar to the species. On October 19 and 21, 1953, 37 males and 6 females were taken at permanent ponds in the vicinity of Hayes Lake in Williams County. On November 2, 1953, a single male was taken at a pond west of Hayes Lake, where the only other Odonata seen were several specimens of *S. vicinum*. Most of them had battered wings. I estimated that they emerged about October 1. Two males were taken at a pond on Gale Run at the Oak Openings October 23, 1953. At the Miller City tile pond in Putnam County, 2 males were secured Sept. 4, and 3 males October 4, 1956. I found that I could generally distinguish the species while resting or in flight. Late collecting may turn up many more records for Ohio.

143. *Sympetrum internum* Montgomery. ***Paulding, *Putnam, *Williams.** A new state record. A male was collected at a nearly dry boggy pond in Northwest Township, Williams County Sept. 24, 1951; on Sept. 26, 10 males and 1 female were taken at the same place. A thorough search on Oct. 14, 1951, failed to turn up a single specimen. Another search was made at the pond in 1952 but none were seen. A single male was collected at a pond 2½ miles east of

Hayes Lake Oct. 21, 1953. At a pond near the mouth of Blue Creek in Paulding County 5 males were taken Oct. 4, 1954. Five males were taken at the Miller City tile pond in Putnam County Sept. 24, 1956 and another male Oct. 4. In favorable artificial light a golden shadow will show on white paper held under the wings. This appears to be a late season species and should be searched for in September. Synonyms for the species are *decisum* (Hagen). and *rubicundulum decisum* (Hagen).

72. *Sympetrum obtusum* (Hagen). **Lucas, Mercer, Paulding, *Putnam, Williams, *Wood.** This is a rather common species. My experience has been that the males will generally have a white face in life and can be determined before taking them.

73. *Sympetrum rubicundulum* (Say). **Defiance, *Fulton, Lucas, Mercer, Paulding, Williams.** This is the most common species of *Sympetrum* here, but I have not found it occurring as late in the season as *S. costiferum* and *S. vicinum*. It appears on the wing about the last of June and may be exceedingly abundant some years. It is found almost everywhere,—at rivers, ponds, lakes, and even fields.

74. *Sympetrum semicinctum* (Say). **Lucas, Paulding, *Putnam, *Williams.** Two somewhat teneral males were taken at Mud Lake July 9, 1951. Two males were secured August 17, 1956, at the Miller City tile pond in Putnam County. The species was locally common in Paulding County in 1956; five males were taken along a ditch on July 13. It is not a common species here and it has a short flight season.

76. *Sympetrum vicinum* (Hagen). ***Lucas, Paulding, Williams.** Two males and 3 females were taken at the Oak Openings Sept. 3, 1952. This small and common red-faced species is usually the last Odonata I collect in the fall; it often occurs in large numbers.

77. *Leucorrhinia intacta* Hagen. **Lucas, Williams.** This is an abundant species at ponds, lakes and canals in this area. A specimen taken in Williams County was determined by Dr. Berror as an odd specimen of this species; it lacks yellow spots on the dorsum of the seventh abdominal segment.

78. *Pachydiplax longipennis* (Burmeister). **Defiance, *Henry, Lucas, *Van Wert.** This is another common species found almost everywhere during the summer. A male was taken at the Schumm sawmill in Van Wert County August 3, 1949.

79. *Erythemis simplicicollis* (Say). ***Auglaize, *Fulton, *Henry, Lucas, *Mercer, Paulding.** The species is common at lakes and ponds. It seems to prefer Diptera and small Odonata for food. Two males were taken at the St. Marys Fish Hatchery August 13, 1951, and 1 male was secured at a pond on the west side of the Grand Reservoir in Mercer County August 27, 1952.

80. *Pantala flavescens* (Fabricius). ***Defiance, Paulding, *Van Wert, *Williams.** One male was taken at the old stone quarry at Willshire August 3, 1949. A male was secured June 24, 1950, at a marl pit near Nettle Lake. A male was captured July 8, 1956, along the Miami Extension Canal in Defiance County. This species is rather uncommon in the area; it is very agile and wary, and I have taken very few specimens.

81. *Pantala hymenaea* (Say). ***Defiance, *Lucas, *Mercer, *Van Wert, *Williams.** One male was taken August 27, 1952, at a pond west of the Grand Reservoir. The Williams County specimen was secured June 24, 1950, at a marl pit near Nettle Lake. Two males were collected at the stone quarry at Willshire August 30, 1949, for the Van Wert County record. A female was captured July 1, 1956, at sand pits at the Oak Openings in Lucas County; it was quite common then. A female was taken July 8, 1956, along the Miami Extension Canal in Defiance County. I find the species much easier to capture than *P. flavescens*.

82. *Tramea carolina* (Linnaeus). ***Williams.** One male was taken at a small pond near Nettle Lake June 3, 1951. While it was flying the wing spots appeared to be bright red, but before I placed it in the cyanide bottle the color had changed to brown. This is a rare species in this area, and I find it extremely difficult to catch.

83. *Tramea lacerata* (Hagen). ***Henry, *Mercer, Paulding, *Van Wert.** A pair were taken August 27, 1952, at a pond west of the Grand Reservoir in Mercer County. Two males were taken August 30, 1949, at the old stone quarry at Willshire in Van Wert County. A teneral female was found August 17, 1956, floating in water (but still living) in a pond near Napoleon in Henry County. The species is common.

85. *Calopteryx aquabile* Say. **Williams.** A male and female were collected June 14, 1951,

at a streamlet southwest of Edgerton. I have found this species only around small spring-fed streams. Due to its brief flight season it may be much more plentiful than is generally believed.

87. *Calopteryx maculatum* (Beauvois). **Lucas, Paulding, Williams.** The Black-winged Damselfly seems to prefer well shaded streams with ripples, but is found sparingly even in ditches and lakes. It is common and easily taken from June to early September.

88. *Hetaerina americana* (Fabricius). ***Lucas, Mercer, Paulding, Williams, *Wood.** The Lucas County specimen was taken below the Providence Dam in the Maumee River August 1, 1952. The Ruby-spot is a common species, found along many streams especially where Water-willow grows. This species was common along Flatrock Creek southwest of Payne in 1943, but has not been observed there since.

89. *Hetaerina titia* Drury. ***Paulding, *Williams.** This rare and beautiful species occurs regularly each season along Fish Creek and the St. Joseph's River north of Edgerton. It is a late season species, much more wary than *americana*, and generally alights higher up on bushes and trees along the bank of the stream, where it is out of reach of the collector. It flies from the last week of August to the first week of October. On August 25, 1953, a male was taken after he released the female. Five males were taken September 2 and 5, 1955, along the Maumee River above the Forder bridge.

91. *Lestes congener* Hagen. ***Lucas, Paulding, *Putnam, Williams.** This small *Lestes* is a late-season species; I take it later than any other *Lestes*. I consider it rather common, as I have observed it in large numbers at some of the Williams County ponds. One male was taken at the Oak Openings Park in Lucas County October 23, 1953. None were seen at the Miller City tile pond in Putnam County September 24, 1956, but 2 males and 1 female were secured October 4, and they did not become common until Oct. 28.

92. *Lestes disjunctus australis* Walker. **Defiance, Lucas, Paulding, *Williams.** A pair was taken in copula June 6, 1949, at a pond near Nettle Lake. I sometimes take this common species as early as the latter part of April. Dr. Borror has examined a number of my specimens labelled *L. forcipatus* and has determined them to be this species. I consider all of my records of *L. forcipatus* questionable.

93. *Lestes eurinus* Say. ***Lucas, *Paulding, *Williams.** A male was secured at a pond of the Paulding Sugar Company at Paulding July 21, 1949 and the following day a battered female was taken at the same place. A male was taken at a pond near Charloe July 14, 1950. On June 28, 1951, 9 males and 2 females were collected at a pond in Florence Township, Williams County. Nine males were taken July 1, 1956, at a sand pit at the Oak Openings Lucas County. This large species is not common at ponds in Paulding County and is uncommon to fairly common at certain Williams County ponds. It probably is more common in Ohio than is generally believed.

95. *Lestes inaequalis* Walsh. **Williams.** This insect occurs sparingly at Mud Lake, where 3 males and 1 female were taken July 9, 1951. On June 17, 1953, 6 males were taken at a pond 2½ miles east of Hayes Lake. This species is not as robust as *eurinus* but seems to be a heavier insect than *vigilax*. It is rare and local.

96. *Lestes rectangularis* Say. **Defiance, Lucas, Paulding, *Putnam, Williams, *Wood.** This is a common species along ditches, ponds and swamps,—in fact, almost everywhere. Several specimens were taken at Dehn's Swamp in Florence Township, Williams County; Dr. Borror termed the males the smallest he had ever seen of the species. I have never been able to take males of this species so late in the season elsewhere.

97. *Lestes dryas* Kirby. **Defiance, Fulton, Paulding, Williams.** This is a common or even abundant species in June at temporary ponds or swampy areas. It usually occurs in large numbers wherever found.

98. *Lestes unguiculatus* Hagen. **Lucas, Paulding, *Putnam, Williams, *Wood.** This is a common species along ditches, streams, ponds, etc.

99. *Lestes vigilax* Hagen. **Williams.** A rare and delicate species that is more delicate than *inaequalis* and is easily distinguished from that species by the inferior appendages of the males. I have found this insect only amongst herbage at Mud Lake. Seven males have been taken on the following dates: June 22, 1949, July 1 and 18, 1950, and July 9, 1951.

100. *Argia apicalis* (Say). **Lucas, Mercer, Paulding, *Van Wert, *Wood.** This is a very common insect. Two males and 1 female were taken August 31, 1949, at a small deep pond at Schumm's sawmill in Van Wert County.

102. *Argia moesta* (Hagen). *Lucas, Paulding, *Williams. This is a common species on the Maumee and Auglaize Rivers but is scarce on the St. Joseph's River. A single male was taken on a boulder in the St. Joseph's River in Williams County June 21, 1949. The Lucas County male was taken below the Providence Dam on the Maumee River Aug. 1, 1952. A male taken at the Maumee River in 1948 was badly used up but still very much alive and able to fly; one wing was broken off near the nodus, two wings were broken off halfway between the nodus and stigma, and only segments 1, 2, 3, and part of 4 of the abdomen remained. The end of the abdomen was dry, indicating that the damage had been done some time previously.

103. *Argia sedula* (Hagen). Williams. Four males were taken at a gravel pit in Northwest Township August 7, 1952. This is the least common of the *Argias* that I have collected.

104. *Argia tibialis* (Rambur). *Henry, Williams. This is a rather common species especially around herbage along rivers and creeks.

105. *Argia violacea* (Hagen). *Henry, Williams, *Wood. This is probably the commonest species of *Argia* in this area; it probably occurs around every pond, stream and lake.

106. *Amphiagrion saucium* (Burmeister). Williams. Seven males of this small red species were collected June 17, 1953, at a spring-fed streamlet southwest of Edgerton. Two females were taken May 21, 1955, at a streamlet that formed the outlet for Hayes Lake; several more were observed. The species has a short flight season in late May and June. It probably is common in Williams County.

107. *Nehalennia gracilis* Morse. *Williams. A single male of this delicate species was taken at Mud Lake July 9, 1951, during a shower. This is my only Ohio specimen. *N. irene* was common at the same place. At Cedar Lake in Lagrange County Indiana, this species is plentiful during the first half of July; it flies with *Nannothemis bella* at a bog there. I found that the best way to take *gracilis* was to drop a large net over the sedges and the insect would rise to the top where it could be easily seen.

108. *Nehalennia irene* Hagen. *Fulton, Paulding, Williams. Three males were taken at a slough of Flatrock Creek southwest of Payne July 18, 1951, and several others were seen. This is a rather common species locally and is not strictly a bog species like *gracilis*.

109. *Chromagrion conditum* (Hagen). Williams. This species was common in 1951 at a little sedge-choked stream near Columbia. On June 3 and 7 I collected 20 males and 6 females and saw many more. Several pairs were observed in copula; sometimes both would cling to a sedge blade in tandem while the female oviposited in tissues of the dead or living plants. Some males would hold themselves erect in a vertical position such as one often sees in *Argia moesta*. By June 17 this species had disappeared.

110. *Enallagma antennatum* (Say). Mercer, Paulding, Williams. This is a common species at ponds, lakes, and gravel pits.

111. *Enallagma aspersum* (Hagen). *Fulton, *Lucas, *Paulding, Williams. One male was taken June 23, 1952, at the Oak Openings Park in Lucas County. Four males were secured at the ponds of the Paulding Sugar Co. at Paulding Aug. 2, 1949 and June 25, 1950. This is much more common than I had believed.

129. *Enallagma basidens* Calvert. *Fulton, Paulding, Van Wert, Williams. A pair in copula was taken at the old stone quarry at Willshire, Van Wert County, Aug. 30, 1949. Two males were taken at Harrison Lake, Fulton County, July 17, 1956. This species probably occurs at every gravel pit and stone quarry in this area.

112. *Enallagma boreale* Selys. Defance, Williams. Both *boreale* and *cyathigerum* are rather large *Enallagmas*. I have found both species at the same ponds. The height of their flight season is about the first half of June.

113. *Enallagma carunculatum* Morse. *Fulton. My only Ohio specimen is a male taken July 17, 1956, at Harrison Lake. I have made considerable effort to take the species at Grand Reservoir. Apparently the species has declined in numbers since Kellicott's time as he wrote (1899), "It has been noted in myriads about Mercer County Reservoir and at Sandusky Bay in July."

114. *Enallagma civile* (Hagen). Auglaize, *Fulton, Mercer, Paulding, *Van Wert, Williams, *Wood. I consider this to be our most common species of *Enallagma* at ponds and lakes.

140. *Enallagma cyathigerum* (Charpentier). *Lucas, *Williams. A new state record. Two males were taken at a pond on the east side of Nettle Lake, June 5, 1949. From June 6 to

19, 1949, 31 males were taken at this pond. The species has been consistently taken at ponds in Williams County since then. A male was taken June 23, 1952, at a sand pit at the Oak Openings Park, for the Lucas County record.

115. *Enallagma divagans* Selys. *Williams. At a deep hole from which water flowed constantly, along a streamlet southwest of Edgerton, 6 males and 1 female were taken June 14, 1951, and 5 males were taken on June 17. At that time they were scarce. On June 17, 1953, a pair in copula was taken at the same place. This is a rare and local species.

117. *Enallagma ebrium* (Hagen). Lucas, *Paulding, Williams. This species is abundant in Williams County and rare in Paulding County. A male was taken at an artificial pond 2 miles north of Melrose July 23, 1951, for a Paulding County record.

118. *Enallagma exsulans* (Hagen). Mercer, Paulding, Van Wert, Williams, *Wood. This species is even more generally distributed than *civile*, being taken at creeks and rivers as well as at lakes.

119. *Enallagma geminatum* Kellicott. *Auglaize, Defiance, *Lucas, Williams. Three males were taken at the St. Mary's Fish Hatchery in Auglaize County Aug. 13, 1951. The record for Lucas County was a male taken June 23, 1952, at a pond on Gale Run. I have taken this species only at clear water lakes and ponds.

120. *Enallagma hageni* Walsh. Defiance, *Fulton, Williams. This is a rather common early-season species in the 3 counties.

121. *Enallagma signatum* (Hagen). *Auglaize, Defiance, Paulding, Williams. One male was collected at the St. Mary's Fish Hatchery Aug. 13, 1951, for an Auglaize County record. This is a rather common species.

122. *Enallagma traviatum* (Selys). Williams. I consider this a rare species. One male was taken at Mud Lake June 29, 1949, and another male was secured June 12, 1949, at Nettle Lake. I don't recall ever taking this insect at a small pond.

123. *Enallagma vesperum* Calvert. Williams. One male was taken at Nettle Lake Sept. 6, 1949, and 1 male was taken at Mud Lake June 11, 1950. This species was abundant one season at Little (Krill's) Lake in Defiance County but has not been seen during the time covered by this paper.

124. *Ischnura posita* (Hagen). Defiance, *Fulton, Lucas, *Mercer, Paulding, *Wood. This is a common species, but not as abundant as *verticalis*. The Mercer County specimen was taken at Achbach's Landing at Grand Reservoir, August 13, 1951.

126. *Ischnura verticalis* (Say). Defiance, *Henry, Paulding, Williams, *Wood. This is such a common insect that I collect very few specimens.

127. *Anomalagrion hastatum* (Say). Paulding, *Williams. Four males were taken at a shallow pond near Nettle Lake July 17, 1949. One male was secured at the tile pond at Haviland in Paulding County, July 30, 1949. The tiny species is local.

THE PREY OF ODONATA

The writer has frequently taken Odonata with prey; a summary of these collections, where the prey was identifiable, is given in table 1. Of the 29 records here reported, the prey in 11 cases was other Odonata (8 of Zygoptera and 3 of Anisoptera); in each case an anisopteran was the predator. In 10 cases the prey was Diptera, in 6 it was a butterfly, and there was one instance each of a mayfly and a caddisfly as the prey.

ODONATA TAKEN AS PREY

On Sept. 10, 1950, at a pond in Williams County, I took a male *Aeshna constricta* from a spider web; it had both left wings fastened in the web. Another male of the same species taken at the same place ten days later also had both left wings fastened in a spider web; it was still alive and struggling. A male *Somatochlora linearis* taken Aug. 20, 1947, at a streamlet in Paulding County, was in a web over the stream and under some trees. A large spider (probably an *Argiope*) was eating it at the time. Arthur Brooks once called my attention to a leopard frog (*Rana pipiens*) that was jumping at ovipositing females of *Sympetrum*

vicinum at Mud Lake. We watched it for some time and saw it jump several times but never saw it succeed in making a capture.

At the Oak Openings in July, 1953, I watched Purple Martins capturing Odonata with the greatest ease. They would swoop low over the water of a small pond and in a few seconds would leave with their prey, apparently for their nestlings. The Odonata taken were mainly *Libellula spp.*, *Anax junius*, *Erythemis simplicicollis* and *Pachydiplax longipennis*.

TABLE 1
Odonata taken with prey

Species	Sex	Date	Locality	Prey
<i>Gomphus exilis</i>	♂	6/24/50	Nettle Lake	Damselfly, <i>Enallagma antennatum</i>
<i>Gomphus externus</i>	♂	8/3/47	Maumee River	Butterfly, <i>Pieris rapae</i>
<i>Gomphus fraternus</i>	♂	6/14/46	Fish Creek	Fly (Diptera)
	♂	6/22/47	Flatrock Creek	Fly (Diptera)
	♀	7/6/47	Fish Creek	Fly (Diptera)
	♀	6/8/48	Fish Creek	Crane fly
	♂	6/8/48	Fish Creek	Crane fly
	♂	6/4/50	Fish Creek	Crane fly
<i>Gomphus grasilinellus</i>	♀	6/11/53	Pond, Williams Co.	Butterfly, <i>Phyciodes tharos</i>
	♀	6/12/52	Nettle Lake	Crane fly
<i>Gomphus vastus</i>	♀	6/2/48	Maumee River	Teneral gomphine dragonfly
	♂	6/2/48	Maumee River	Teneral dragonfly, <i>Gomphus fraternus</i>
	♀	8/5/48	Maumee River	Damselfly, ♂ <i>Argia moesta</i>
<i>Gomphus ventricosus</i>	♂	6/8/46	Fish Creek	Crane fly
<i>Dromogomphus spoliatus</i>	♂	8/5/46	Eagle Creek	Butterfly, <i>Pieris rapae</i>
	♂	8/25/50	Brown Twp., Paulding Co.	Butterfly, <i>Pieris philodice</i>
	♂	8/19/49	Flatrock Creek	Butterfly, <i>Phyciodes tharos</i>
<i>Basiaeschna janata</i>	♂	6/5/49	Mud Lake	Dragonfly, <i>Leucorrhinia intacta</i>
<i>Boyeria vinosa</i>	♂	9/8/46	Fish Creek	Damselfly, <i>Hetaerina titia</i>
<i>Anax junius</i>	♂	4/29/48	Mud Lake	Mayfly
<i>Libellula pulchella</i>	♂	6/23/44	Miami Extension Canal	Damselfly, <i>Lestes</i> sp.
<i>Leucorrhinia intacta</i>	♂	6/16/46	Pond, Williams Co.	Damselfly, <i>Ischnura verticalis</i> , ♀
<i>Erythemis simplicicollis</i>	♂	6/17/44	Miami Extension Canal	Deer fly, <i>Chrysops</i> sp.
	♀	8/28/45	Nettle Lake	Fly (Diptera)
	♀	7/20/49	Pond, Paulding Co.	Damselfly, <i>Enallagma civile</i>
	♀	7/22/49	Pond, Paulding Co.	Butterfly, <i>Phyciodes tharos</i>
	♀	8/2/49	Pond, Paulding Co.	Damselfly, <i>Enallagma civile</i> , ♂
<i>Argia moesta</i>	♀	6/28/53	Hayes Lake	Damselfly, <i>Argia</i> sp.
	♀	8/5/48	Maumee River	Caddisfly

A pair of Purple Martins had large but unfeathered young in a bird box in our yard in June, 1951. On June 22 and 26, I watched the birds return to the box with Odonata. With the aid of field glasses, I determined one specimen as *Pachydiplax longipennis* and two others as *Anax junius*. Twice after seeing the birds leave after they had carried in an *Anax junius*, I found no trace of the dragonfly nor could I find any trace of its wings on the ground below the nesting box; if the birds carried the wings away in their beaks I failed to see them. It is my opinion that the swallows catch more Odonata than the flycatchers do in this area. If swallows are plentiful at a lake or pond, I have often found the *Enallagma* collecting to be poor at the place.

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